Fender®

MADE IN U.S.A.

MA6 MIXER AMPLIFIER

(PUBLIC ADDRESS SYSTEM)



OPERATION INSTRUCTION MANUAL

MANUAL NO. 014558 (REV. A)

WARNING

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE

P/N 016637

MA6

MIXER AMPLIFIER

OPERATION INSTRUCTION MANUAL

BY

Fender®

MADE IN U.S.A.



PHYSICAL DIMENSIONS (APPROXIMATE, FOR SHIPPING PURPOSES)

	MIXER AMPLIFIER		SPEAKER COLUMN	
	U.S. System	**Metric System**	**U.S. System**	**Metric System**
Weight	50 Pounds	22.67 kg	62 Pounds	28.0 kg
Width	25 Inches	63.0 cm	19 Inches	48.0 cm
Depth	23 Inches	58.0 cm	13.5 Inches	34.0 cm
Height	7.5 Inches	19.0 cm	36.5 Inches	93.0 cm

P.O. BOX 4137 • 1300 EAST VALENCIA DRIVE • FULLERTON, CALIFORNIA 92634

NOTE: See accompanying limited warranty folder

TABLE OF CONTENTS

LIST OF FIGURES

NOTE: The "Items," specified in the text are the individual units shown in the Figure.

INTRODUCTION

The Fender MA6 is composed of a mixer with six input channels and two output channels, a reverb unit, a 200 watt power amplifier, and two speaker system enclosures. The mixer, reverb, and power amplifier are contained in one compact package, hereafter referred to as the "Mixer." Each speaker enclosure contains two 12" special design cone speakers and a high frequency compression driver with associated horn and crossover network mounted in a Thiele aligned vented enclosure.

The remaining pages of this Manual detail the functions of the various controls and jacks (in total, the unit has 55 controls and 24 connectors and jacks). BEFORE ATTEMPTING TO USE THE SYSTEM, FAMILIARIZE YOURSELF WITH THE INFORMATION CONTAINED IN THIS MANUAL.

SECTION I

FUNCTIONAL BLOCK DIAGRAMS

The architecture of the System is explained most easily with the accompanying functional block diagram which is divided into two sections, the Preamplifier (Fig. 1) and the Master Control (Fig. 2). Although only one preamplifier is shown, the actual System has six which are identical.

INPUT CHANNEL CONTROL FUNCTIONS

Gain Control (Fig. 3 - Item 1)

This adjusts the gain of the microphone preamplifier, allowing adjustment of the Mixer to provide the optimum signal-to-noise ratio for the particular input source to that channel. With a normal input signal, when the red LED overload warning light (Fig. 3 - Item 6) is just flickering, the control is properly set. If the light glows continuously, the control should be turned down until the light just flickers, to avoid audible distortion.

The gain control affects both the Main and the Monitor mixes. Normally, once the Gain Control has been set, it will not need to be changed.

Treble Control (Fig. 3 - Item 2)

This boosts or cuts the high frequency content of the input signal. See Figure 4 for frequency response curves.

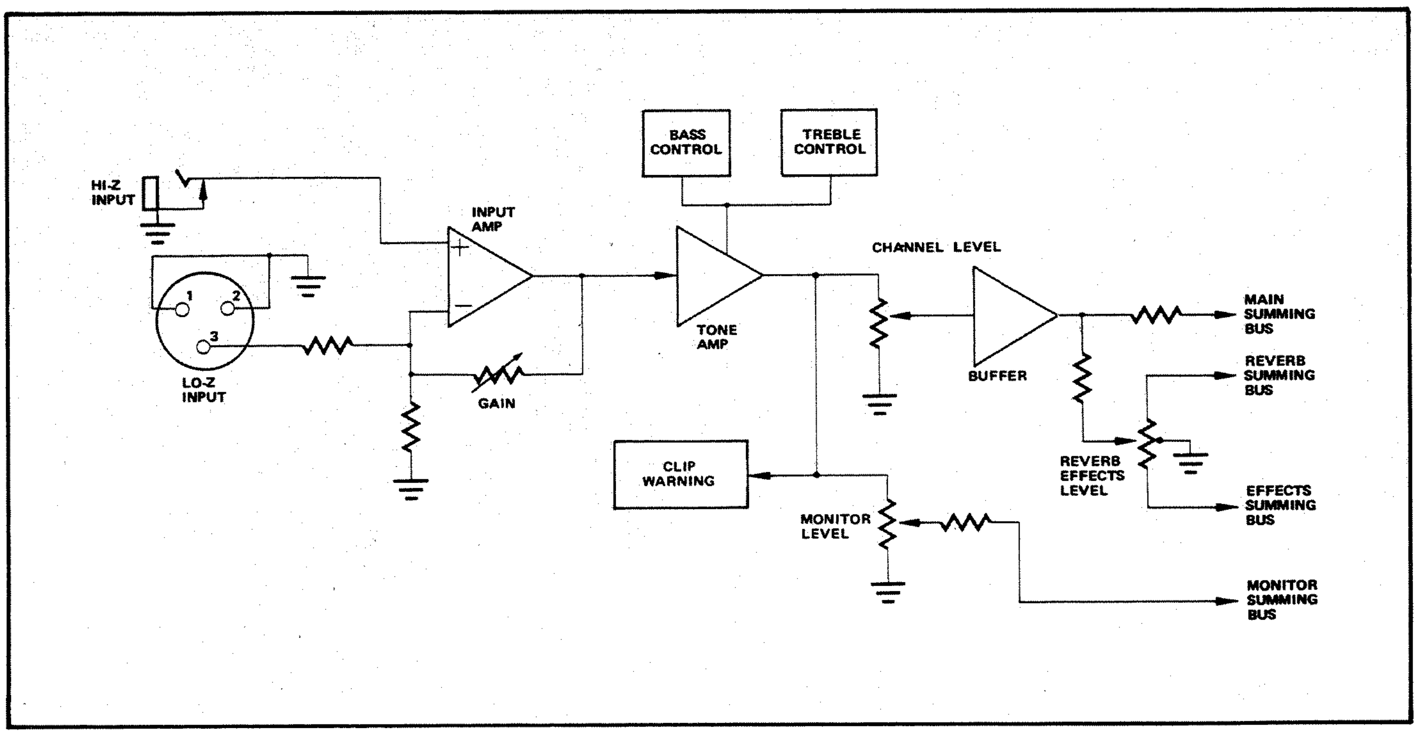


FIGURE 1 — Pre-Amp Section (one channel of six) Block Diagram

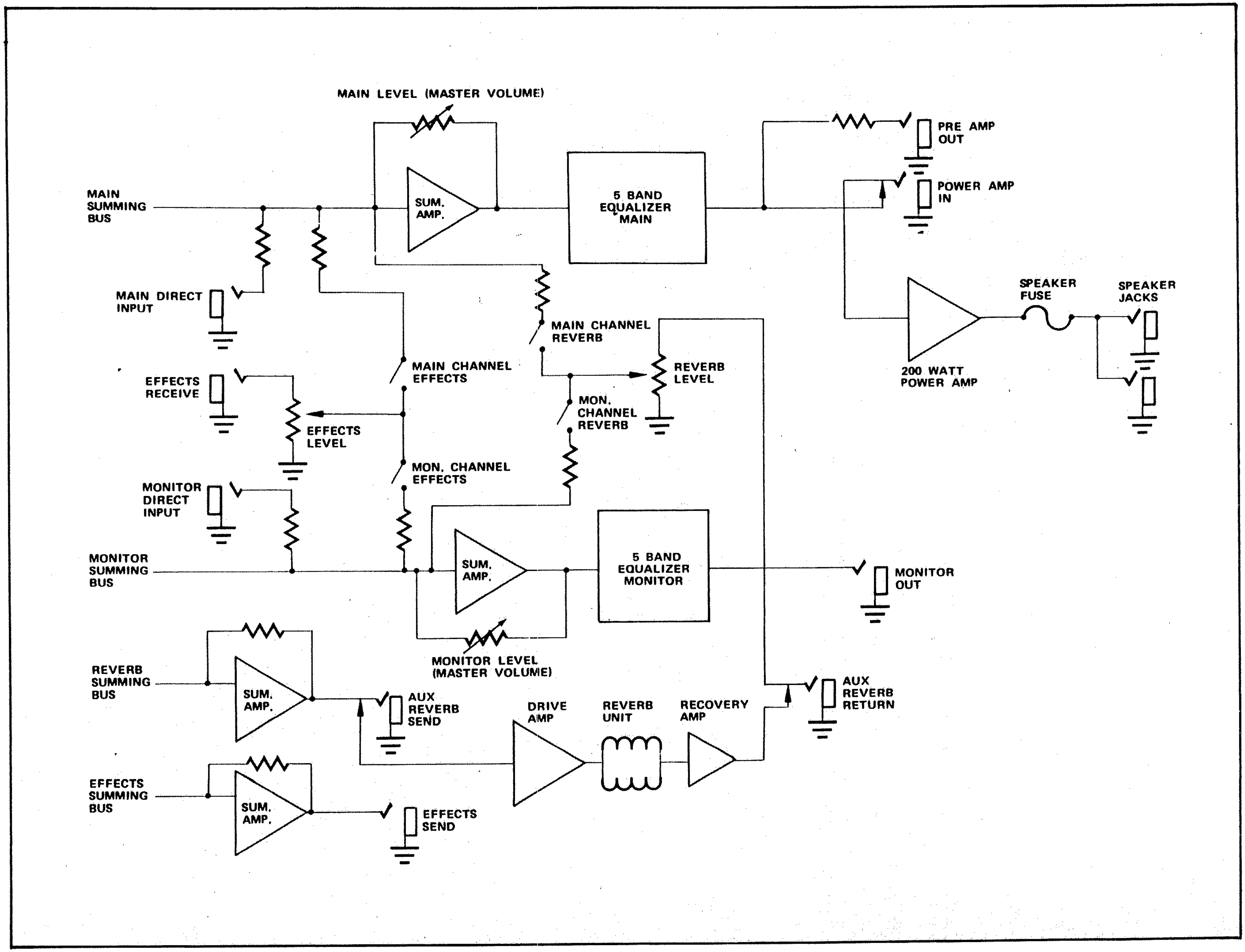


FIGURE 2 — Master Section Block Diagram

Bass Control (Fig. 3 - Item 3)

This boosts or cuts the low frequency content of the input signal. See Figure 4 for the frequency response range of this control.

Effects/Reverb (Eff/Rev) Control (Fig. 3 - Item 4)

Turning this control clockwise from the center detented position sends the signal from this channel to the internal reverb unit (or an auxiliary unit if one is plugged in).

Turning the control counterclockwise sends the signal to the Effects Send jack located on the lower portion of the control panel.

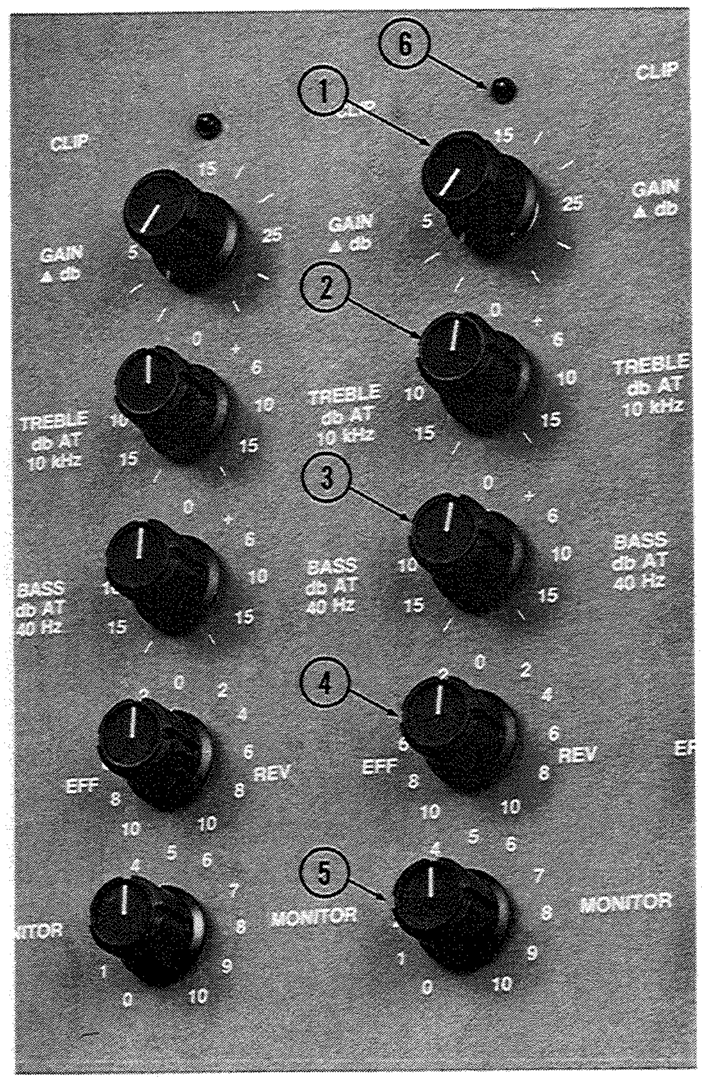


FIGURE 3 — Pre-Amp Section Controls

This is a post-fader control, that is, the level of the signal is a function of the Channel Level control.

Monitor Control (Fig. 3 - Item 5)

This control establishes the monitor mix in the same way as the Channel Level control establishes the main mix. It is independent of the Channel Level control so that the monitor mix will not be changed by changes in the main mix. The monitor signal, however, is a function of the channel Bass and Treble controls so that a more representative monitor mix can be obtained.

Channel Level Control (Fig. 5 - Item 3)

This controls the level of the signal going into the main mix and the level going to the Effects/ Reverb control.

MASTER SECTION CONTROL FUNCTIONS

Main Channel Master Level Control (Fig. 6 - Item 1)

This adjusts the composite level for the Main channel output. It actually controls the gain of the summing amplifier thereby preventing it from over-loading. This means that the Channel Level controls can be operated at higher levels while the Master Level can be operated at lower levels, improving the useable signal-to-noise ratio. Loudness of the Main channel is indicated by the VU Meter (Fig. 7 - Item 3).

Monitor Channel Master Level Control (Fig. 6 - Item 2)

This provides the same control for the Monitor output that the Main Level control does for the Main channel.

Reverb Return Control (Fig. 6 - Item 3)

This controls the amount of the Reverb Return signal (whether from the internal reverb or from an auxiliary reverb) that is added to the Main and/or Monitor mixes.

Main Channel Reverb On/Off Switch (Fig. 6 - Item 4)

Turns the Reverb Return signal on or off in the Main mix.

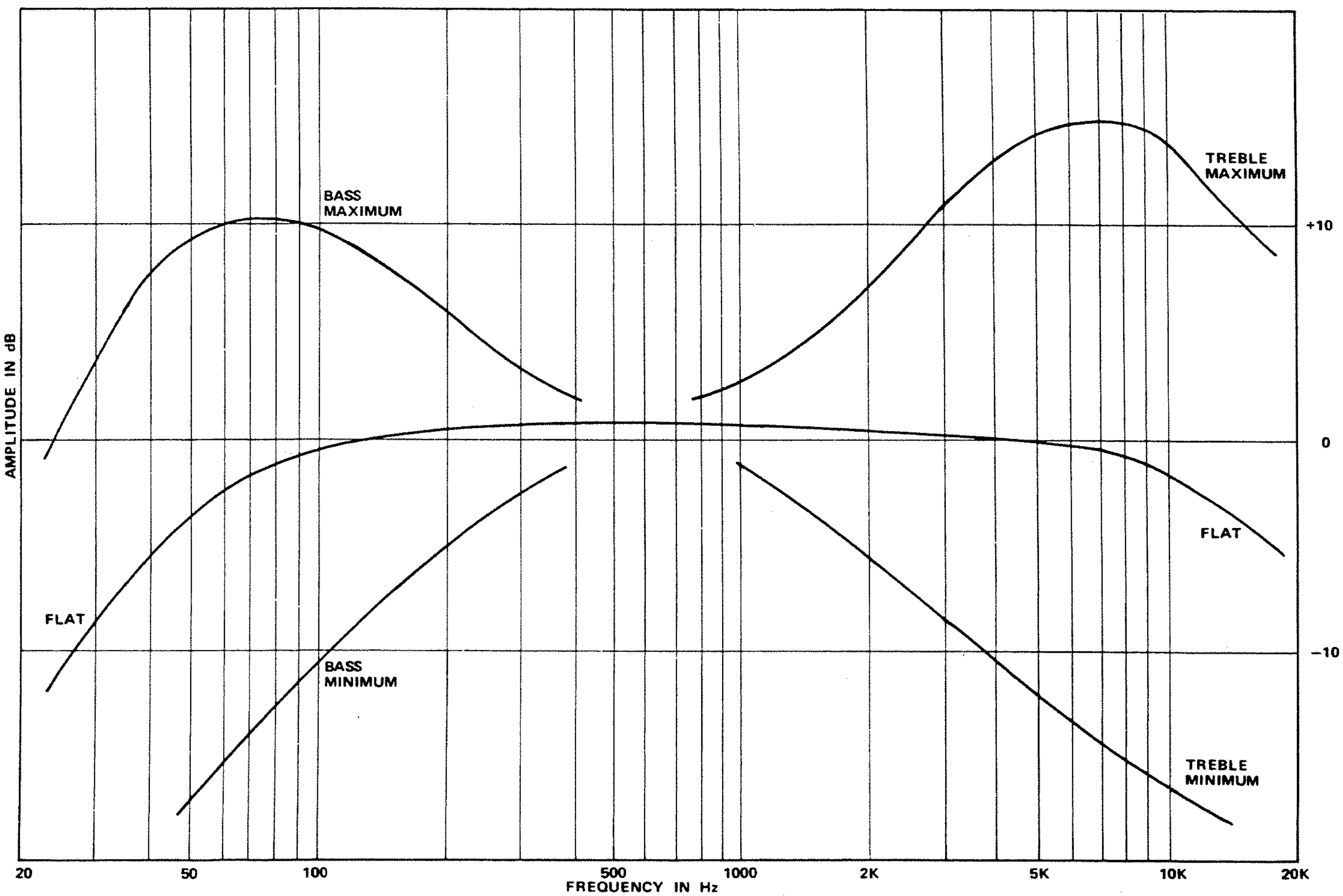


FIGURE 4 — Pre-Amp Response Curves

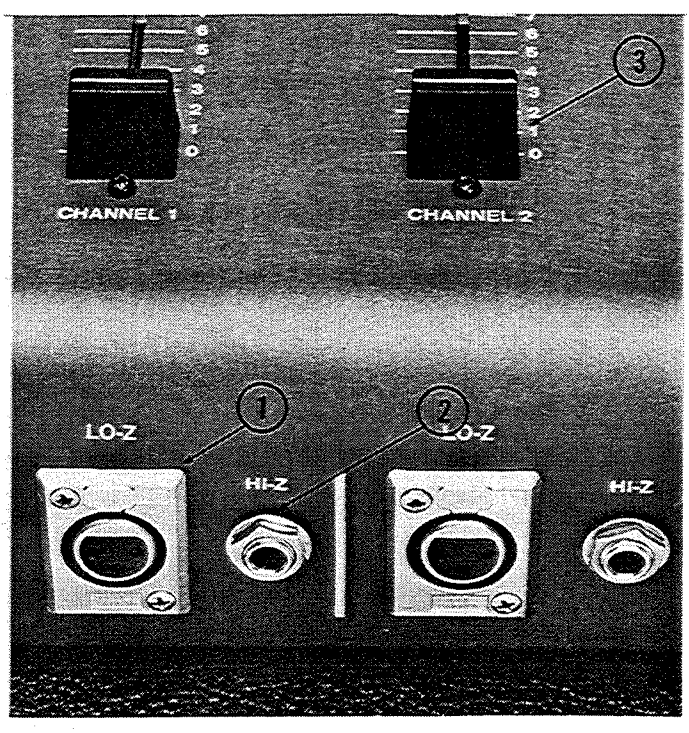


FIGURE 5 — Pre-Amp Jacks and Level Controls

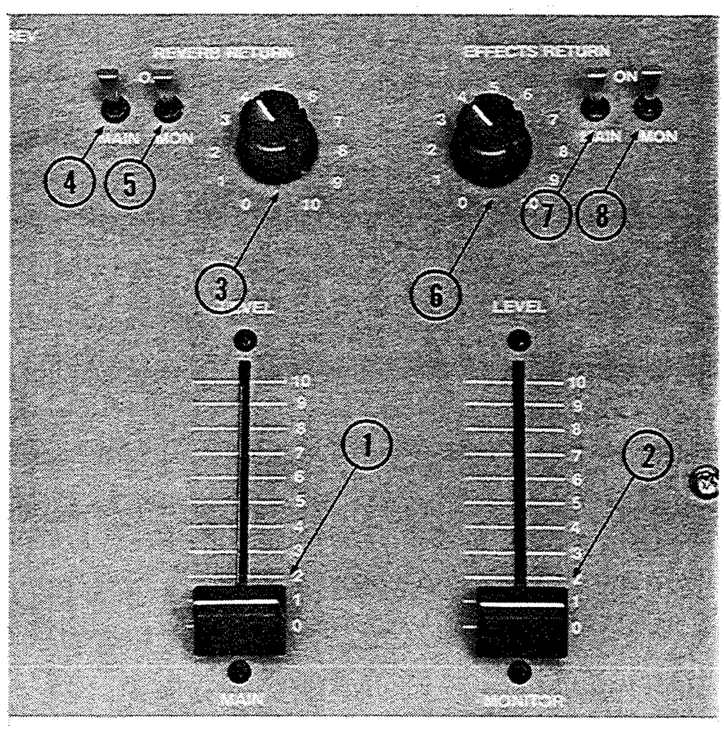


FIGURE 6 — Master Section Level Controls

Monitor Channel Reverb On/Off Switch (Fig. 6 - Item 5)

Turns the Reverb Return signal on and off in the Monitor (Mon) mix.

Effects Return Control (Fig. 6 - Item 6)

Controls the amount of effects signal added to the Main and/or Monitor mixes.

Main Channel Effects On/Off Switch (Fig. 6 - Item 7)

Turns the Effects Return signal on and off in the Main mix.

Monitor Channel Effects On/Off Switch (Fig. 6 - Item 8)

Turns the Effects Return signal on and off in the Monitor mix.

Main Equalizer (5 Slide Controls) (Fig. 7 - Item 1)

Controls frequency response, boost and cut for the Main output channel. The response of the five controls is indicated in Figure 8.

Monitor Equalizer (5 Slide Controls) (Fig. 7 - Item 2)

Controls frequency response, boost and cut for the Monitor output channel. The response of the five controls is indicated in Figure 8.

VU Meter (Fig. 7 - Item 3)

Indicates the relative output of the internal power amplifier. For a clean output signal, the meter should not exceed 0 VU other than on extreme transients.

PRE-AMP INPUT CONNECTORS

Each channel is provided with a three pin low impedance (Lo-Z) microphone connector (Fig. 5 - Item 1) designed to be used with a low impedance microphone in the range of 50 to 250 ohms. The input is unbalanced and pin 3 is the signal input pin.

A high impedance (Hi-Z) phone jack is also provided for each channel (Fig. 5 - Item 2). This jack allows use of a high impedance (50K to 150K ohms) microphone, and will also accept most line level signals by reducing the channel Gain control.

NOTE:

> Only one input should be used at any one time on each channel. While both inputs are active simultaneously, the gain balance for a low and high impedance input will most likely be unsatisfactory.

AUXILIARY CONNECTORS (Front Panel)

DIRECT INPUTS

Main (Fig. 9 - Item 1)

This jack allows connection of a signal directly into the Main summing amplifier. It is useful for chaining additional mixers. Chaining is discussed in Section II under "MIXER USE."

Monitor (Fig. 9 - Item 2)

Same as above for the Monitor summing amplifier.

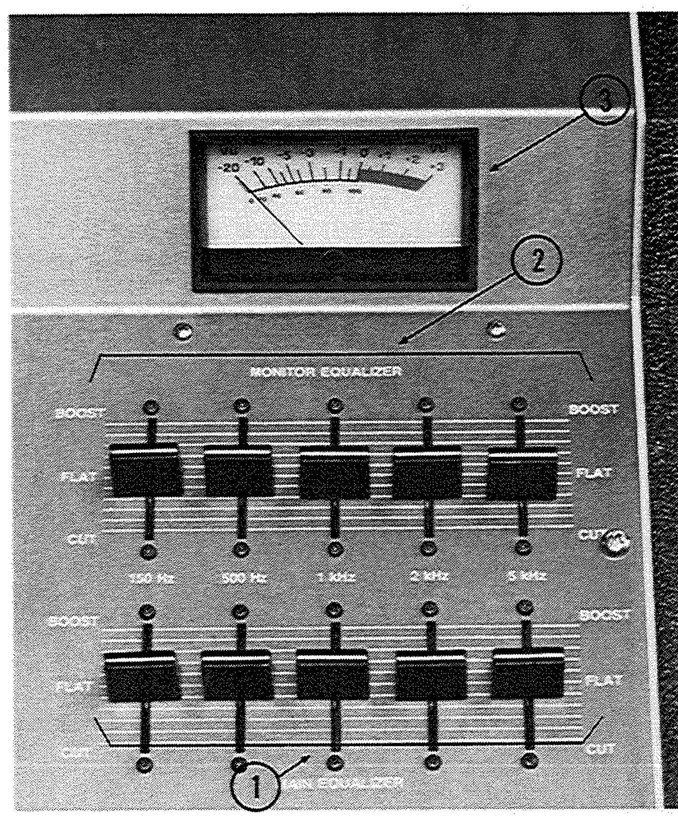


FIGURE 7 — Equalizer Controls and VU Meter

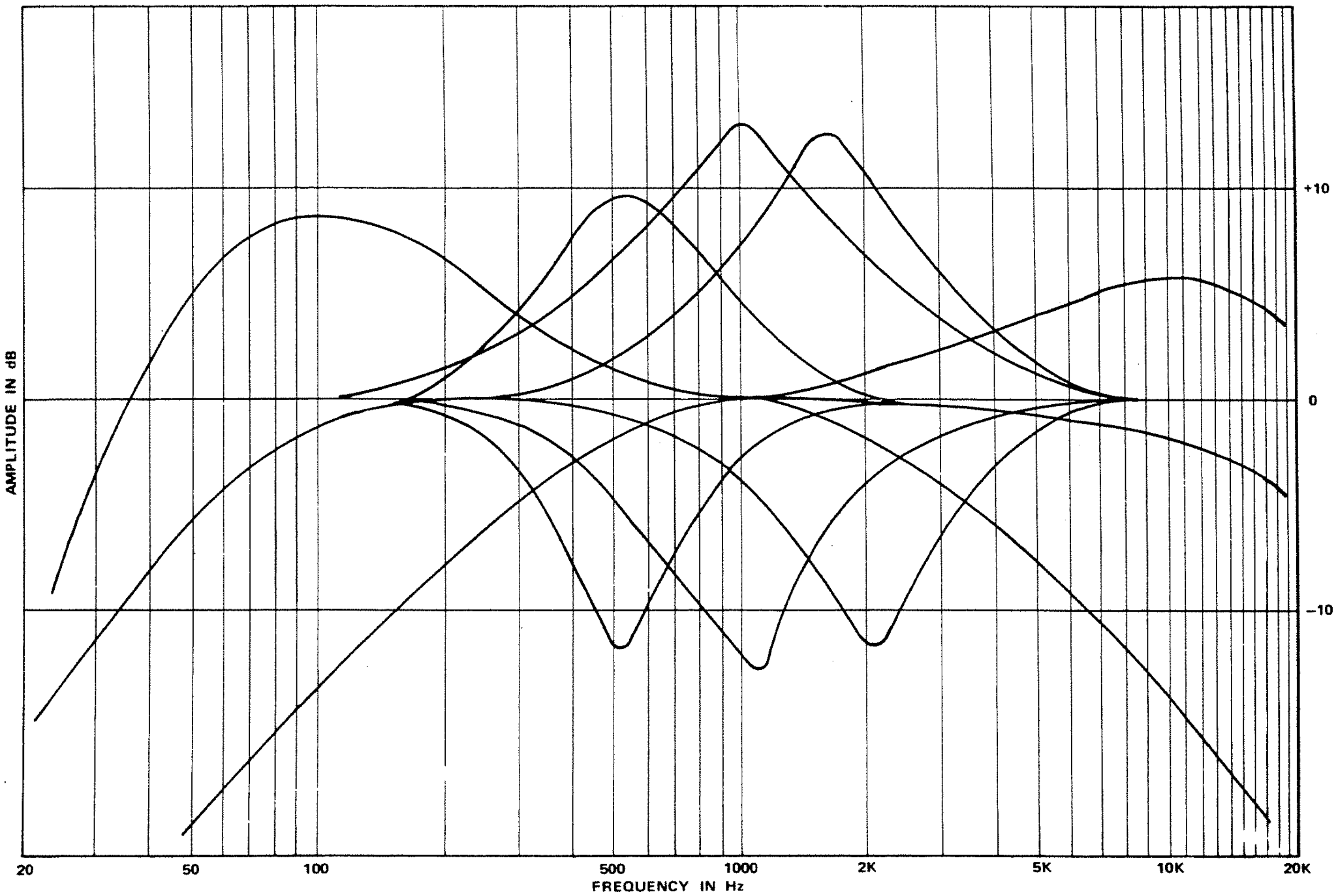


FIGURE 8 — Equalizer Response Curves

EFFECTS

Send (Fig. 9 - Item 3)

This jack is used to send the signal from the 6 channels to the external effects device (minimum 2K ohms impedance) providing that the Eff/Rev knob (Fig. 3 - Item 4) is in the proper position as noted in "Effects/Reverb Control."

Receive (Fig. 9 - Item 4)

This jack receives the output signal from the external effects device and routes the signal to the Effects Return control. The nominal input impedance for this jack is 10K ohms. The signal level should be at least 100 mV rms.

REVERB FOOT SWITCH JACK

(Fig. 9 - Item 5)

Provides connection for the Reverb Foot Switch which turns the reverb on or off. It functions only if the front panel controls are set to provide reverb.

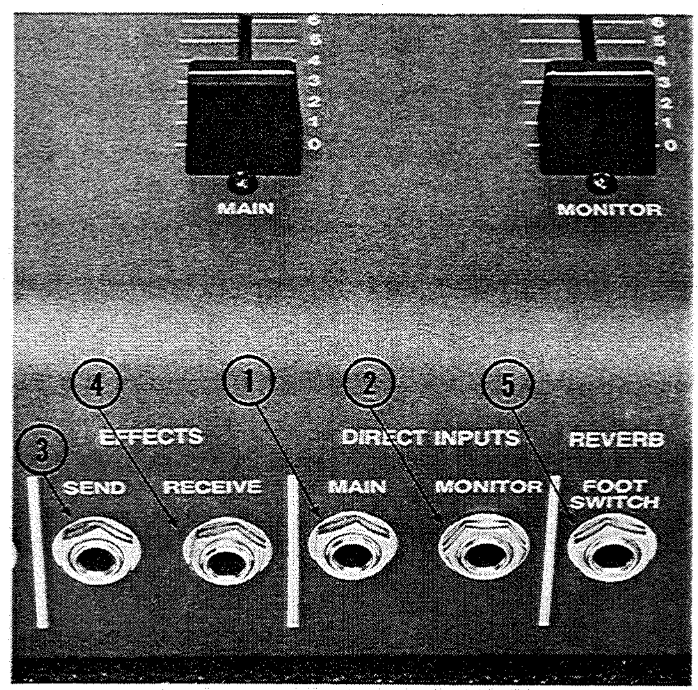


FIGURE 9 — Master Section Effects, Direct Inputs, Reverb Jacks

AUXILIARY JACKS (Rear Panel)

Auxiliary Reverb Send (Fig. 10 - Item 1)

This jack is used to provide an input signal to an external reverb unit, bypassing the internal reverb unit.

Auxiliary Reverb Return (Fig. 10 - Item 2)

This jack is used to connect the output of the external reverb unit to the Mixer, disconnecting the internal reverb unit.

Power Amp Input (Fig. 10 - Item 3)

This jack is used to connect an external signal directly to the internal power amplifier (input impedance 5K ohms), disconnecting the internal signal.

Pre-Amp Output (Fig. 10 - Item 4)

This jack provides the Main channel mixer output (just ahead of the power amplifier) for use in external devices. The load impedance on this signal should not be less than 5K ohms.

Monitor (Pre-Amp) Output (Fig. 10 - Item 5)

The Monitor channel output is present at this jack. It should be connected to an external power amplifier (minimum 2K ohms impedance) and monitor speakers.

ADDITIONAL REAR PANEL CONTROLS AND CONNECTORS

Power On/Off Switch (Fig. 10 - Item 6)

Speaker Output (Fig. 10 - Item 7)

Two jacks wired in parallel for connection of the speaker systems to the power amplifier. Total impedance of the speakers should not be less than 4 ohms.

Speaker Fuse (Fig. 10 - Item 8)

This fuse is connected in series with the speaker jacks. It protects the speakers in the event of an amplifier failure and protects the amplifier from a low impedance load. This fuse is 5 amperes and should be replaced only with the same type.

Accessory AC Outlet (Fig. 10 - Item 9)

This can be used for connecting other electronic devices which do not require more than 400 watts input power.

Line Cord Receptacle (Fig. 10 - Item 10)

Connection for the detachable 120 VAC power cord. Cord wraps are provided in the mixer cover for storage of the cord.

Circuit Breaker (Fig. 10 - Item 11)

The circuit breaker provides protection in the event of internal amplifier failure. The breaker is reset by pushing in the red button.

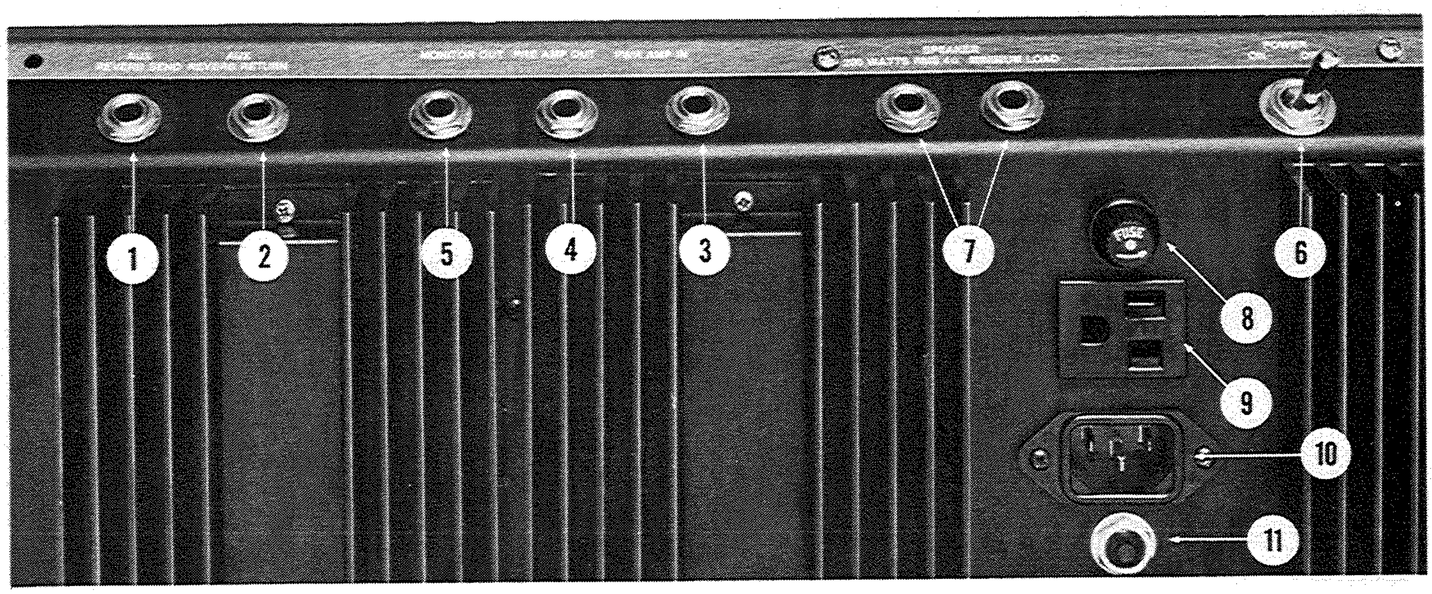


FIGURE 10 — Rear Panel

SECTION II
SETTING UP THE SYSTEM

Speaker Placement

Placing the speakers forward of the microphones (Fig. 11) will allow much higher volume levels before feedback occurs.

Speaker Connection (Fig. 12)

Connect speaker cables to the phone jacks on the rear panel of the Mixer, marked "Speaker." Use only "line" or "zip" cord for speaker connections. The use of shielded guitar cords for speaker hookups will cause a loss of volume.

NOTE:

Shielded cables *can* be used in an *emergency* with no damage to the power amp or speakers.

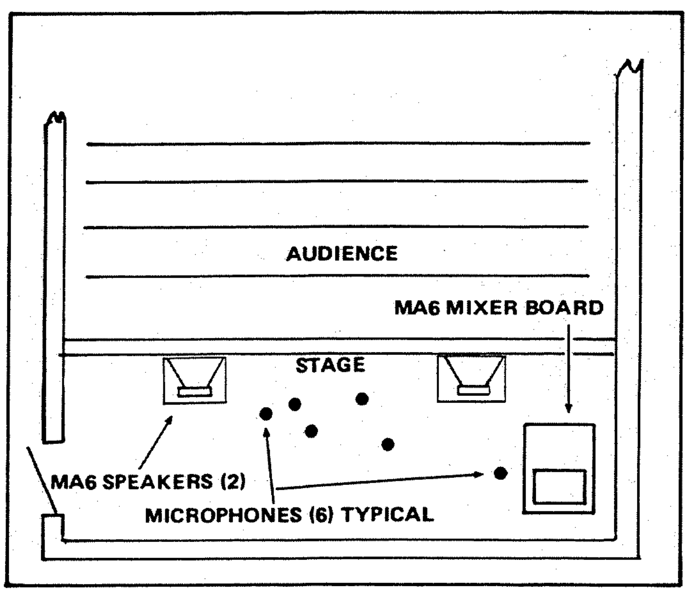


FIGURE 11 — Typical Stage Setup

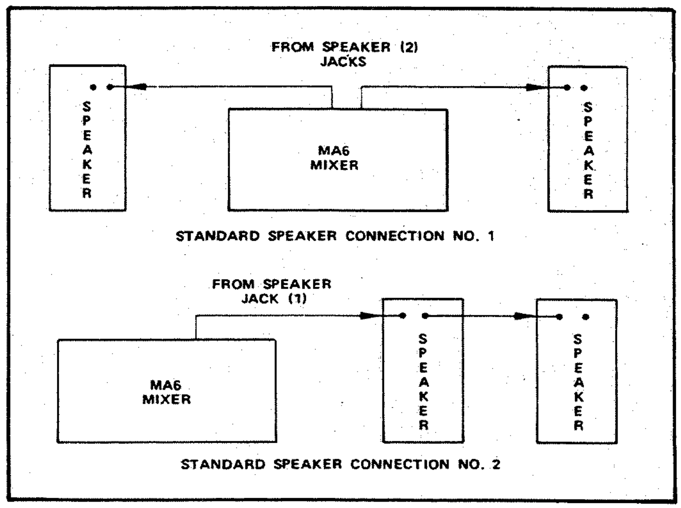


FIGURE 12 — Speaker Connections

Microphones

High impedance microphones plug into the Hi-Z phone jacks (Fig. 5 - Item 2).

Low impedance microphones plug into the Lo-Z 3 pin connectors (Fig. 5 Item 1).

Use only the Hi-Z or the Lo-Z input in each channel at one time.

AC Power Cord

Remove the 120 VAC power cord from the inside of the Mixer cabinet top and plug it into the AC socket in the rear of the Mixer (Fig. 10 - Item 10). An accessory AC outlet (Fig. 10 - Item 9) is provided directly above the power cord socket. DO NOT remove the grounding prong of the AC plug — it prevents hum and possible electric shock. If necessary, use a three-prong to two-prong adapter.

Preliminary Control Settings

1. Set all Channel, Main, and Monitor Level controls ("faders") to their minimal positions (Fig. 5 - Item 3) (Fig. 6 - Item 1 and 2).

2. Turn Gain controls to "25" (Fig. 3 - Item 1).

3. Set all Bass and Treble tone controls (Fig. 3 - Item 2 and 3) to the "flat" (center) position.

4. Set both Main and Monitor equalizers (Fig. 7 - Item 1 and 2) to their "flat" (center) positions.

5. Effects and Reverb switches should be "off" (Fig. 6 - Items 4, 5, 7 and 8).

6. Turn the power switch on (Fig. 10 - Item 6). If the VU Meter does not light up, check the power cord connections and the circuit breaker. If it lights up but no sound comes from the speakers, check the speaker cable connections and the speaker fuse on the rear of the Mixer (Fig. 10 - Item 8).

7. Set the Main Level control (Fig. 6 - Item 1) to "4" or "5".

Final Control Adjustments

Volume — While someone is singing into the microphone at a performing level, slowly turn up the Channel Level control until the speakers are producing the desired volume.

NOTE:

> If the red overload warning light just above the Channel Gain control is glowing, the P.A. will probably sound distorted. To get the cleanest possible sound and best signal-to-noise ratio, turn the Gain control counterclockwise slowly until the light flickers. A performer with a quiet singing voice may require the Gain control to be set to the full clockwise position. Line level devices, like tape recorders, will probably need to have the Gain control set to almost the "off" or fully counterclockwise position. The Gain control is "ahead" of the Pre-Amp Monitor control and, therefore, affects the Monitor volume.

Tone — The tone controls (Fig. 3 Item 2 and 3) are "ahead" of the overload warning light. This means that boosting the Treble and/or Bass may cause the red light to glow, indicating overload of the Channel. Simply turn the Gain control counterclockwise until the light flickers.

If reverb is desired, turn the Pre-Amp Effects/Reverb control (Fig. 3 - Item 4) to the right (clockwise). If external effects are to be used, turn the channel Effects/Reverb control to the left. The center position, "O", (no effects or reverb).

NOTE:

> Also turn on and adjust the Master Reverb or Effects Return controls and switches (Fig. 6). The reverb footswitch, when plugged in, switches the internal (or external, if used), reverb on and off in both the Main and Monitor speakers.

Set the Channel Level controls (Fig. 5-Item 3) for the proper mix or "blend." Use the Main Level control (Fig. 6-Item 1) to set the overall volume level.

The preceding covers the basic set-up of the MA6 P.A. System. The following are some extra features and operating notes:

Master Section Reverb Return and Effects Return Switches (Fig. 6 - Items 4, 5, 7 and 8)

Adding reverb, either through the Main channel or Monitor channel, increases any system's tendency to feedback or ring. A singer may want the audience to hear some reverb (through the Main speakers), but he wants a higher volume level through the Monitor speakers. If he turns off the Monitor reverb, he can turn the Monitor volume up higher before feedback occurs.

Emphasizing One Instrument on the Monitor Speakers

If it is desirable for one of the instruments to be especially emphasized on the Monitor speakers, this can be done by connecting an extra input cord from that instrument to the Effects Receive jack (Fig. 9-Item 4) and turning on the Effects Return Monitor switch (Fig. 6 - Item 8). Then adjust the Effects Return control (Fig. 6 - Item 6) to the desired volume.

Equalizers

The MA6 has two 5-band graphic equalizers (Fig. 7 - Item 1 and 2) one for the Main speakers and one for the monitors. These equalizers are used to adjust the tonal quality to suit the acoustics of the room and to give more volume before feedback occurs. Exam-

ple: If the room has a resonance around 120 Hz, simply lower the 150 Hz equalizer control until the feedback disappears. The center position indicates "flat" response.

Explanation of the Equalizer Controls

150 Hz — This is a shelving-type control and acts like a bass tone control. Too much boost and the System will sound muddy. Cutting this control a bit will help eliminate feedback from a miked acoustic guitar, as well as "cleaning up" the vocals by minimizing bass frequencies from bass drums, basses, and foot-tapping.

500 Hz (Peaking) — Important vocal range. Don't touch unless you have to — and then be judicious about it. Boosting can cause any singer to sound like a horn.

1 kHz and 2 kHz (Peaking) — Very important, as most instruments have harmonics in this range. Boosting these frequencies causes the System to sound nasal or "tinny." Sometimes cutting 2 kHz *slightly* can bring the vocals "on top" of the music.

5 kHz — This is a shelving-type control and acts like a treble tone control. Maximum shelf is at 10 kHz. A slight boost with this control adds presence or better definition of voices. Too much boost and the System will "ring."

MIXER USE

Use of an Additional Mixer (Fig. 13)

The Fender MA6 can be used either as a Master unit when chaining another mixer to gain additional input channels, or as an expander. If it is used as the master unit, connect the Main channel output of the other mixer to the Direct Inputs Main jack (Fig. 9 - Item 1) and the Monitor channel to the Direct Inputs Monitor jack (Fig. 9 Item 2). This allows control of the entire System with the Master section controls of the MA6.

If the MA6 is to be used as an expander with another Master unit, the Pre-Amp Out jack (Fig. 10 - Item 4) and the Monitor Out jack (Fig. 10 - Item 5) should be connected to the Master unit. Use the Master section controls of the MA6 as Submasters.

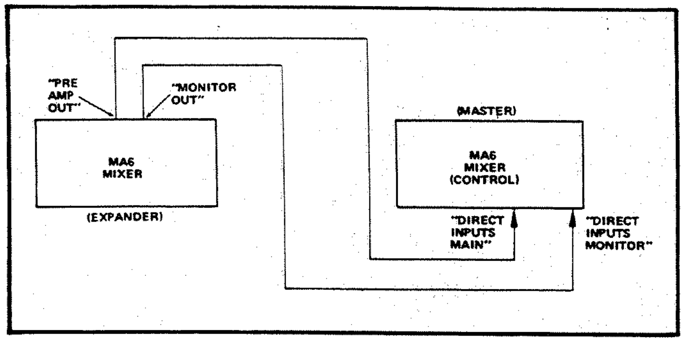


FIGURE 13 — Chaining Mixers

Effects Send and Receive Jacks (Fig. 9 - Item 3 and 4)

The mix at the Effects Send jack can be used for several functions. If two different monitor mixes are required, this jack can be used for the second monitor mix and can also be used for tape recording.

Phasers, Flangers, Delay lines, or other signal processors may be used in the effects loop. The Effects Send jack should be connected to the input of the signal processing device and the output of the device to the Effects Receive jack (Fig. 14).

Monitor Out Jack (Fig. 10 - Item 5)

This jack is usually connected to an external power amp for the Monitor speakers. It can also be used for tape recording (Fig. 15).

Auxiliary Reverb Send and Return Jacks (Fig. 10 - Item 1 and 2)

Use these jacks to bypass the internal reverb system. If they are used, they are equivalent to the Effects Send and Receive jacks and may be used in the same way.

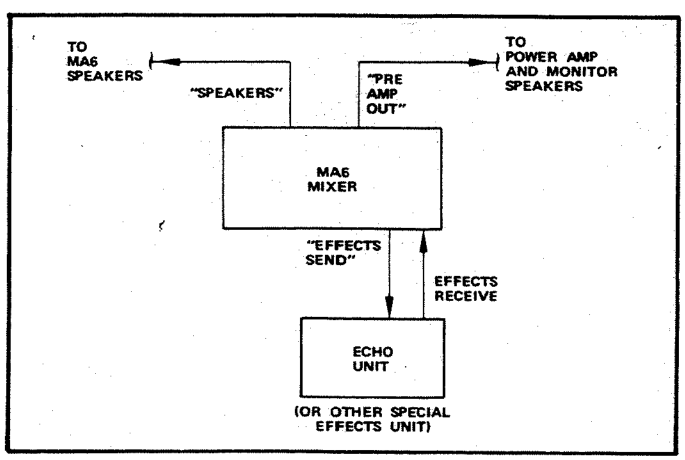


FIGURE 14 — Effects Jack Connections

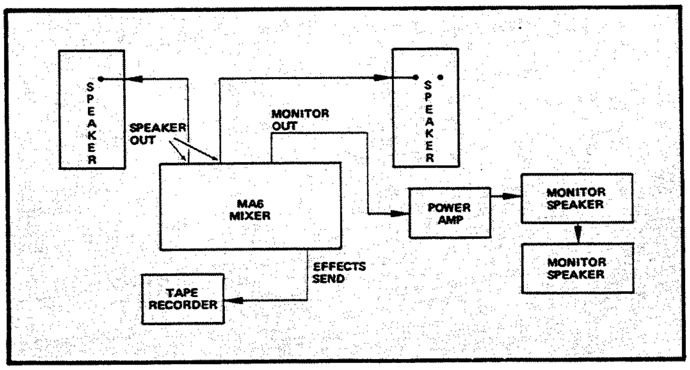


FIGURE 15 — Typical Speaker, Monitor, and Tape Recording Connections

Pre-Amp Output Jack (Fig. 16)

To use an additional amplifier to power more speakers, connect the Pre-Amp Output jack to the Input of the additional Power Amp.

Bi-Amping with an additional P.A. System (Fig. 17)

Connect the Pre-Amp Output jack (Fig. 10 Item 4) to an electronic crossover. If the MA6 is to be used for bass, use bass speaker enclosures and connect the Pwr Amp In jack (Fig. 10 - Item 3) to the "low" output of the crossover, and connect the "high" output of the crossover to the additional P.A. amplifier which should use high frequency speakers. If the MA6 is to be used for highs, reverse the System.

Speaker Output Jacks and Speaker Systems

The Power Amp will supply 200 watts into a 4 ohm load through a 5 amp fuse mounted on the rear panel. The fuse protects the amplifier from damage which could be caused by speaker loads of less than 4 ohms. Replace the fuse only with the same type. Each speaker system (enclosure) is 8 ohms and has two jacks in parallel. Two systems connected together make a 4 ohm load.

Pre-Recorded Tapes

To play back pre-recorded tapes, connect the tape recorder to one of the Direct Inputs jacks (Main or Monitor) (Fig. 9 - Item 1 and 2) or to the Effects Receive jack (Fig. 9 - Item 4), if it is not already in use. The Effects circuit has its own level control.

Tape Recording (Fig. 18)

To record the main channel signal, connect the tape recorder to the Pre-Amp Output jack (Fig. 10 Item 4).

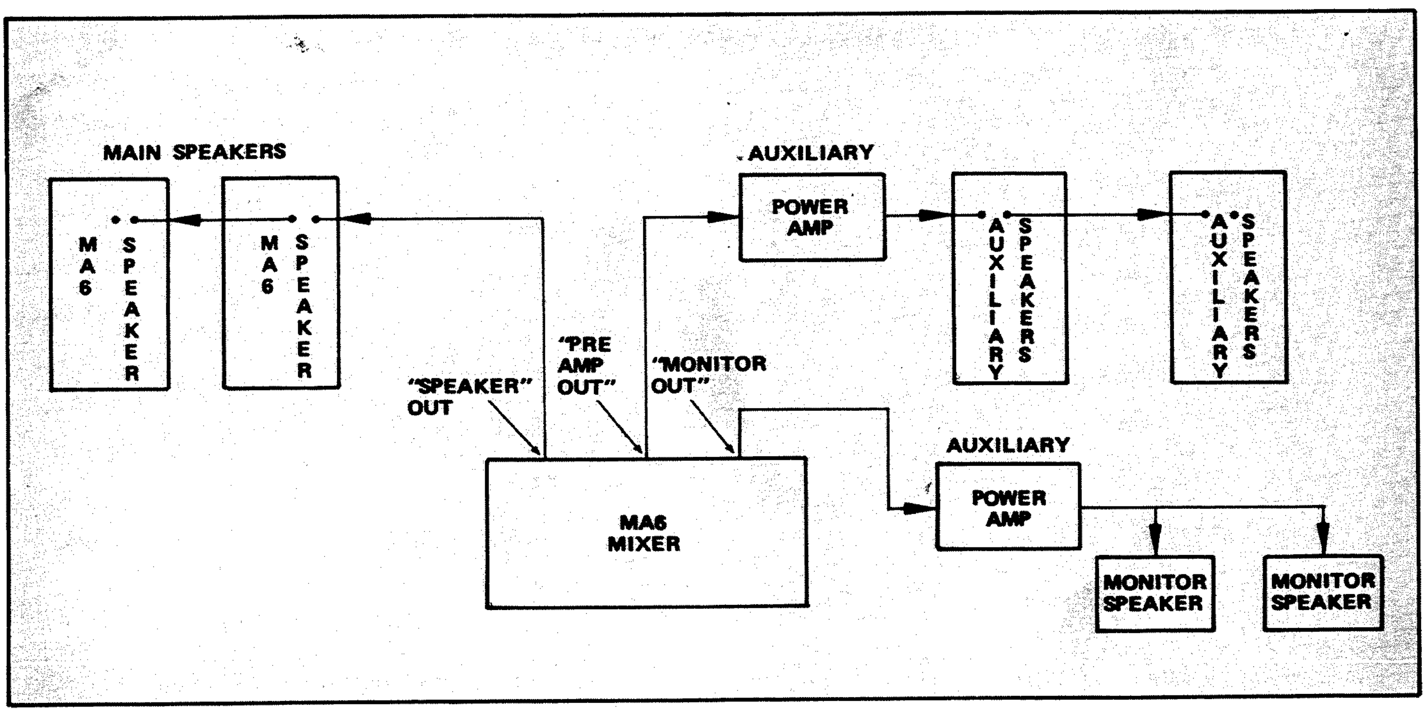


FIGURE 16 — MA6 System with Auxiliary and Monitor Speakers

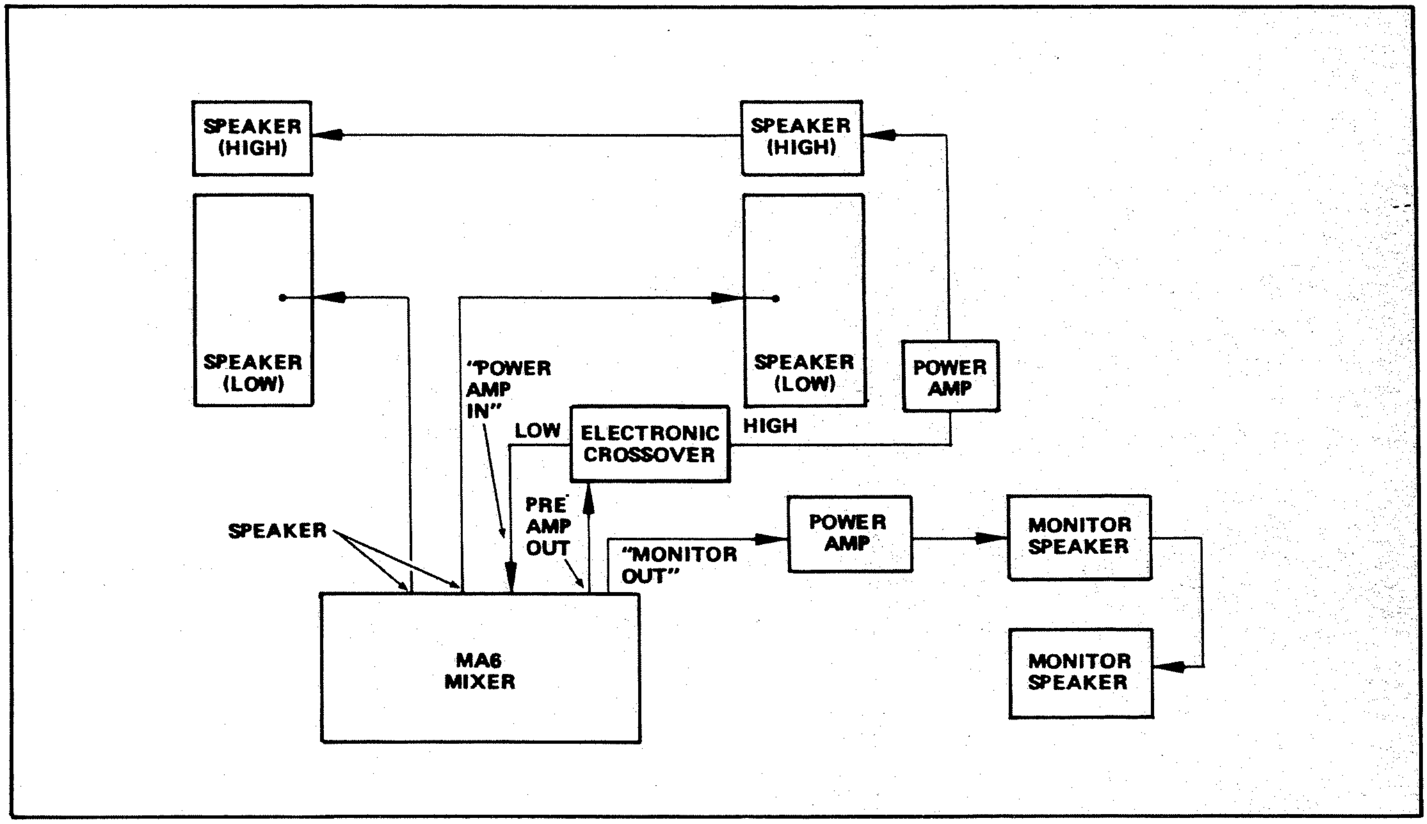


FIGURE 17 — Bi-Amp Connections

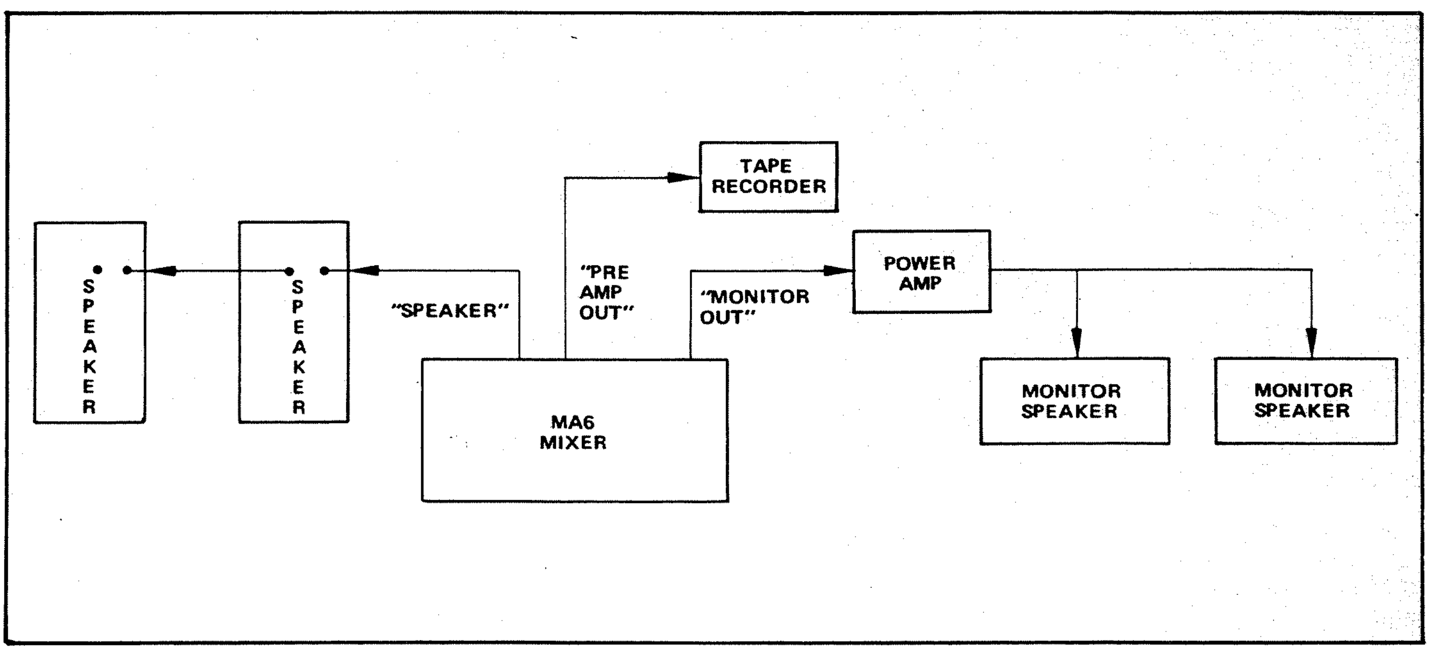


FIGURE 18 — Tape Recording

SECTION III
6 CHANNEL PA SPEAKER SYSTEM

12 HF Speaker Enclosure System (Fig. 19)

The Fender MA6 Public Address System is supplied with two speaker enclosures. Each enclosure contains two high efficiency 12" low frequency speakers mounted in a Thiele aligned vented box enclosure and a compression driver mid and high frequency horn. An internal crossover network provides the correct frequency input to the horn and the bass speakers. The electrical connection to the speakers is achieved through either of the two ¼" phone jacks, connected in parallel, on the rear of the cabinet. The nominal impedance of each speaker system is 8 ohms. The two speaker systems connected in parallel will provide the desired 4 ohm amplifier load.

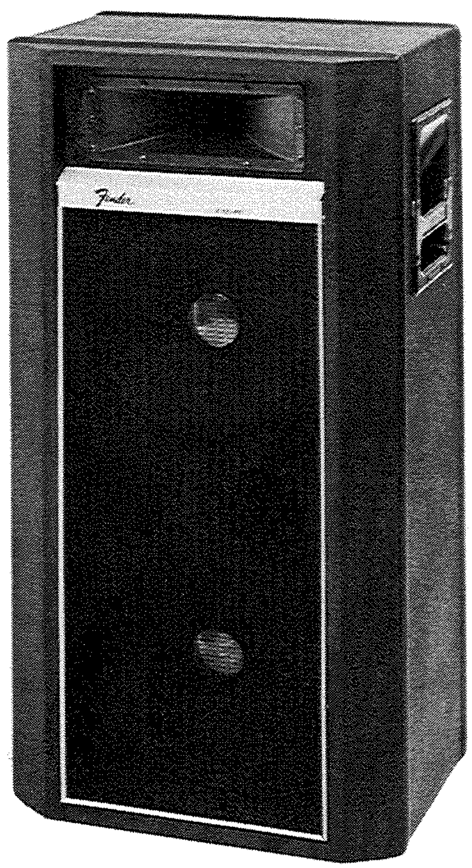


FIGURE 19 — Speaker Column

NOTE: SEE ACCOMPANYING LIMITED WARRANTY FOLDER

Fender®

MADE IN U.S.A.

P.O. BOX 4137 • 1300 EAST VALENCIA DRIVE • FULLERTON, CALIFORNIA 92634